Chapter 9

ISD CONSIDERATIONS FOR INTERNET-BASED INSTRUCTION

Overview

Introduction

This chapter describes ISD considerations for the analysis, design, development, implementation, and evaluation of Internet-Based Instruction (IBI).

What is IBI?

As described in Chapter 3, IBI encompasses the range of instruction and data provided *on-line* over the Internet/WWW - from simple text-based files and applications to interactive multimedia instruction.

Note: A stand-alone course that is downloaded via the Internet/WWW (from an FTP or web site) to an individual PC and accomplished solely *off-line* by learners, is not classified as IBI within the context of this chapter.

Where To Read About It

This chapter contains five sections:

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Overview (continued)

References

The material in this chapter is based on the following references:

- MIL-PRF-29612, *Training Data Products*
- MIL-HDBK-29612-1, *Department of Defense Handbook, Guide for Acquisition of Training Data Products and Services*
- MIL-HDBK-29612-2, *Department of Defense Handbook, Instructional Systems Development/Systems Approach to Training and Education*
- MIL-HDBK-29612-3, *Department of Defense Handbook, Development of Interactive Multimedia Instruction (IMI)*
- MIL-HDBK-29612-4, *Department of Defense Handbook, Glossary of Training Terms*
- *Distance Learning Curriculum Analysis and Media Selection,* Air University, Maxwell AFB, AL, 4 Feb 1994
- AF Handbook 36-2235, *Information for Designers of Instructional Systems, Volume 4*
- AF Manual 36-2234, *Instructional Systems Development*
- AFDLO Home Page web site: *http://www.au.af.mil/afdlo*
- WWW Virtual Library – Distance Education: *http://www.cisnet.com/~cattales/Deducation.html*
- Online Delivery Software: *http://www.ct.bc.ca/landonline/*

Current Capabilities

If learners are geographically separated so that distance and time zones are a barrier to the use of other alternatives (such as resident training, VTCs and audioconferences), and if learners have access to adequate computer equipment and the Internet, the instructional solution of choice may well be IBI. A skilled developer can change content on the Internet quickly, which means that IBI may be highly appropriate for dynamic course content. Depending on the structure of the course, learners can see which students are on line; they can converse in chat rooms or forums; they can communicate with instructional staff in both synchronous and asynchronous modes. Designers can employ a wide variety of techniques to lead learners through the course content, provide opportunities for interaction, and reinforce learning objectives. Special skills are required to design a quality IBI course, but authoring systems and instructional aids are available to facilitate IBI development.

The future capabilities and instructional potential of IBI are significant. Technology is revolutionizing IBI and is changing the way we look at distance learning. Advances in computer network technology, compression algorithms, streaming technologies, and improvements in bandwidth will permit virtually unrestricted access to instructional materials stored in various, non-centralized locations on demand, enabling learning to occur independent of time and distance.

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Overview (continued)

Current Constraints

Technical constraints such as the capabilities of learners' PCs (modem speed, etc.), bandwidth availability, and network interfaces limit the speed that data can be transmitted and received over the Internet/WWW. This equates to transmission delays and "slow-loading" web pages, particularly when the pages are complex in structure and/or content.

Bandwidth is an issue in three areas: on each Air Force base, between bases, and between the DoD Defense Information Services Network (DISN) backbone and the Internet.

- Base blueprints are being enhanced to reflect the growing reliance on connectivity and to prepare for access to a DoD upgraded backbone.
- Bandwidth impinges primarily on the level of technical sophistication one can employ from a central server that is accessed by all students in the user community.
- Vendors are offering audio and video streaming technologies to mitigate the bandwidth problem, but these typically employ small video windows at frame rates less than the rate at which somewhat smooth video is attained.
- Some base LAN policies currently prohibit streaming; this impacts design considerations.

Before You Begin

Using the latest development tools, course providers can develop and deploy web-based instruction with increasing speed. However, the potential for the proliferation of uncoordinated variations of web-based courses throughout the Air Force is a point of major concern.

Before initiating an IBI project, research current development tools and assess their applicability. In addition, consult the AFDLO homepage for current guidance on the use of IBI, and for information concerning hardware and software standards, operating systems standards, and database management requirements.

Section A

IBI Analysis

Introduction

The analysis process for IBI is similar to the process described in Chapter 7 for IMI. Both of these instructional technologies can support self-paced and self-directed interactive instruction. IBI is also similar to CMC in that both can support instructor-led or group-paced conferencing and collaboration. The differences lie in their application and delivery method.

When To Use IBI

Consider using IBI when:

- There are large numbers of learners distributed over diverse time zones and duty locations.
- Learners cannot travel to the training site or be absent from their duty station for extended periods.
- Availability of instructors with subject matter expertise is limited.
- "Hands-on" training is not required. IBI is good for knowledge and attitude objectives, but has limited application for motor skill objectives.
- "Just-in-time" training is needed.
- On-demand instruction is required.
- Instruction needs to be platform independent (not limited to Windows, Mac, Unix, etc. environment).
- Frequent updates or revisions are required in the course materials.

Other Considerations

Other general considerations for IBI include:

Time for IBI course preparation:

- Some types of IBI can be set up quickly if required.
- On-line conferences require only the time it takes to inform participants.
- Simple WWW pages can be created in only slightly more time than text document. However, it may require an instructor to be on-line for an extended period of time once the conference begins.

Cost of IBI course preparation:

- Some supporting IBI can be implemented at very little additional cost if pre-existing resources for E-mail, chat room, etc., are used.
- Can also be costly if IBI applications are required to be run on a high-end, server with a fast network connection.

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Analysis (continued)

Is IBI Cost-Effective?

The cost-effectiveness of any media is dependent on its fit with the instructional objectives and training environment. If the learner population is widely dispersed geographically so that several time zones are involved, the course content is fairly straight forward, and the objectives can be achieved without hands-on instruction, IBI can be a very cost-effective solution. If the material is complex, students are collocated, and/or hands-on training is required, IBI will not only not be the most cost-effective, but it is likely that the instructional objectives will not be realized.

Both direct and indirect costs must be considered in the analysis process. In addition, all constraints must be examined for cost impact. For example, if near term funding is extremely limited, a phased approach to training may be used, with IBI as the ultimate delivery media. Cost analysis will include:

- **Training cost/cost avoidance:** Will the expected IBI cost savings offset the development costs?
- **Course life cycle cost:** Will development and maintenance costs be offset during the expected life of the IBI course?
- **Return on Investment:** Is the expected ROI acceptable? (Refer to Chapter 4.)

Defining the Training Development/ Delivery Options

The three critical tasks of the analysis phase are the definition of the learning population, the definition of the instructional objectives, and the definition of the learning environment. Who is the target trainee group? What is the learning environment? What are the objectives of the instruction? What tools do learners have available? The better these variables are defined, the more accurately the development/delivery options can be analyzed for suitability and cost-effectiveness.

Continued on the next page

Analysis (continued)

IBI Feasibility The following table provides some considerations for determining the feasibility of IBI:

IBI Feasibility Determination

	A	B	C
	Type of Factor	**What to Examine**	**Impact on IBI Decision**
CONTENT			
1	Content characteristics	Learning objectives	Consider how best to match the technology to the objectives of the course. Will IBI be used to distribute course information (syllabus and notices), for supplementation (links to resources)? Will major course components be presented on the web? Or will the entire course be provided by means of the web? Will the instruction be synchronous or asynchronous?
2	Stability of Content	Supported instructional system data	Consider IBI if frequent updates or revisions are required.
3	Course life cycle	Supported instructional system data	Consider IBI if development and maintenance costs can be offset during the life of the course.
COST			
4	Training cost	Projected savings resulting from use of IBI - Return on Investment (ROI)	Consider IBI if the cost savings can offset development cost within a specified time period.
ORGANIZATIONAL			
5	Staff availability	Resources and commitments	Consider IBI if development/delivery/support staff is available.
6	Staff experience	Resumes	Plan time for learning curve if staff is inexperienced with distance learning instruction/ equipment. Include support personnel (e.g., help desk) in assessment.
7	Attitudes toward IBI	Staff meeting reports	Plan for IBI awareness training if resistance is high.
8	Support for IBI	Survey management attitudes	Plan for development of position paper if support is low – get buy-in.
STUDENT			
9	Computer literacy	Unit/student surveys or records	Consider IBI if student has previous computer-based and Internet learning experience. Plan for student training if computer/Internet literacy is low.
10	Attitude toward IBI	Unit/student surveys	Plan for IBI awareness training prior to actual instruction if resistance is high.
COMPUTER/NETWORK RESOURCES			
11	Instructional equipment	Equipment at all applicable sites	Consider IBI if required server/client hardware and software are available.
12	Network infrastructure	Existing and planned Internet/Intranet network system	Consider IBI if computer network connections/ infrastructure are, or will be, available to support instruction on a reliable basis.

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Analysis (continued)

Develop The Plan

Depending on the role IBI will play in the course (informational, supplemental, dependent, or fully-webbed), define IBI resource requirements and constraints. Refer to Chapter 2 for planning and management factors to be considered. Depending on the requirements and constraints defined, consider options; define the alternatives for obtaining required resources (e.g., use of advanced development tools may eliminate the requirement for skilled programmer).

Consider the effort and all risks involved with the development of the planned instruction. Determine if:

- In-house development is feasible.
- The project scope, requirements, and/or schedule exceed in-house capabilities and require contract support.

The recommended plan of action should reflect the most cost-effective solution to the instructional requirement. Obtain buy-in from senior management and the customer before beginning the design phase.

Section B

IBI Design

Introduction

The design of the IBI project is dependent on a host of issues which must be defined. Bandwidth availability, infrastructure, development and delivery tools and browsers, delivery standards, security issues, user configuration requirements, user access, student tracking, scalability requirements – these are some of the factors that must be examined. Some of these will have been defined during the analysis phase. Others will be defined as the design process begins. Be sure to contact the Base Network Communications Center (BNCC) and check the AFDLO Home Page for the most up-to-date guidance.

This section discusses instructional strategies and methods, key design considerations, and constraints for IBI delivered in a synchronous and/or asynchronous mode.

Design the Instructional Strategy

During this phase, the instructional designers will refine the instructional approach and define the instructional design (organization and presentation of content to meet desired learning objectives).

It is useful to have a both a subject matter expert and a representative of the learner population participate in the design phase (refer to Chapter 2 for a list of IBI development team roles and responsibilities). As the instructional objectives are examined, each of these players can provide valuable insight on the optimum use of Internet resources. A few of the factors to consider:

- Hardware and software requirements for development and delivery.
- Whether and how chat rooms should be constructed.
- How instructor/learner and learner/learner discussions will be conducted.
- How and when learners will receive feedback.
- For a synchronous course, whether and which portions of the course should be asynchronous (and vice versa).
- How learner achievement will be assessed.
- How frequently the course content changes and how it will be updated.
- Relative functions of the website, newsgroup, and e-mail.
- What the contingency plans are for network failure (for synchronous instruction).

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Design (continued)

Design the IBI Structure

The following chart describes a few of the structural options associated with IBI design. Again, the designer must decide how best to use the technology – how best to draw or lead the learner through the instruction.

WWW Mode	Description
Linear Mode With Hierarchies Attached	This mode is best when the designer wants the learner to follow a particular path through one portion of the site. More than a single path can lead through a given portion of the site. Other portions of the site are not accessible within paths of a particular portion, though they are accessible from the uppermost page within that portion's hierarchy.
Hierarchical Mode	Very similar to the linear mode with hierarchies attached; access to different portions of the site is only possible from the upper most page in the hierarchy (e.g. the Home Page or the Administration page). This could, in effect, divide the site into four or five smaller sites such that they are independent of each other and access can be controlled by an administrator.
Web Mode	This format is best for delivering student-centered instruction, allowing a multitude of paths interconnected with each other from which students can explore. Web mode is not effective for a testing situation, since in testing you would want the user to follow a particular path through a battery of tests, or when linear instruction is intended, progressing through a set of instructional modules from beginning to end.

Define Structure and Content of Support Media

IBI may include photographs, videos, audio tracks, and embedded graphics. The design phase is the time to define the role support media will play in the IBI program. This is also the time to do trade-offs among the support media alternatives to define the most cost-effective way of achieving the instructional objectives.

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Design (continued)

Technical Considerations

Some technical information that will need to be obtained to identify limitations that may be placed on IBI design include:

- What type of connection to the Internet does the delivery computer have? Is a dial-in provider, such as an Internet Service Provider (ISP) to be used?
- Will a fast Ethernet connection, ISDN line, T-1 or ATM connection be available?
- What are the connection data transfer rates upstream and downstream?
- What standards and protocols apply (technical standards such as authoring software, file name conventions, connectivity protocols, bandwidth limitations, security and user access control, etc.)?
- Which web browser, such as Internet Explorer or Netscape, will be used? Which version will the design be mapped to? What plug-ins will be required?
- What type of computer will accommodate the delivery of the IBI based on the selected browsers?
- What computer or server will house the courseware?
- How many students will be accessing the IBI at a given time and for how long?
- What security provisions are required for collection and management of Privacy Act data?

The design of IBI graphics and files will generally be limited by the lowest, or least capable, student access method and computer configuration (web browser version).

It is important to note that highly interactive multimedia IBI with extensive graphics, animations, simulations, and video is not yet a realistic option due primarily to available bandwidth limitations. Currently, IBI can only effectively imitate IMI through the use of HTML hyperlinks to other files and pages with limited graphics, sound, and motion video.

However, as network infrastructure, bandwidth, and hardware/software support capabilities continue to improve and expand, multimedia IBI (e.g., video, animation, audiographics) becomes more attractive as an instructional alternative. However, until transmission and bandwidth issues are resolved, the design process for IBI must factor its limitations into the instructional program.

Refine The Plan

The project plan should be refined to reflect the decisions made and approved during the design phase. In addition, the instructional designers should have prepared a design document which will guide the development team through the next phase.

Section C

IBI Development

Introduction

The primary focus during the development phase should be on developing the instructional program based on the decision made during the design phase. During the development phase, the instructional developers must constantly evaluate the materials to ensure they are not building in technical complexity which could compromise the success of the program. That is, attention must always be paid to the both the technical capabilities and the limitations of IBI.

This section provides technical considerations and helpful hints for the development of IBI programs.

Development Phase

The steps accomplished during the development phase include:

- Preparing the Plan of Instruction and Course Control Document.
- Preparing the Lesson Plan for the instructor.
- Developing the instructional courseware/materials.
- Lesson validation/evaluation.

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Development (continued)

Key Project Team Activities

Key IBI project team actions and responsibilities for development of IBI include:

Instructional Development:

- Determine if any existing materials can be used and delivered over the Web.
- Determine who will develop and maintain the courseware.
- Develop user-centered interface design or style guide (navigation features, metaphors, colors, graphics, etc.)
- Design a template for presentation of the instruction (pre-positioned and coded navigation controls, repeating screen elements, etc.)
- Determine what level of working knowledge of (HTML, VMRL, or CGI scripting, etc.) is required for designers or instructors.
- Identify Web server support and database management/configuration control procedures.
- Develop storyboards and obtain SME/client review and approval.
- Create instructional media/content (text, still graphics, video, narration, etc.)

Student Administration/Evaluation:

- Establish procedures for officially registering and tracking students.
- Define student access and password procedures.
- Define technical support structure and requirements (e.g., help lines that are available for users who may not be familiar with this mode of instruction).
- Establish evaluation strategies.
- Develop tests and exams and define associated security and administration procedures.
- Define metrics and data collection/tracking procedures (e.g., how to collect and track data via on-line methods).
- Establish requirements and procedures for archiving student materials.

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Development (continued)

Basic IBI Components

Regardless of the type of IBI, the following components should be part of an on-line IBI product:

Home Page: This is the first page that a student will see after gaining access to the course.

- It should be simple and should avoid large, complicated graphics.
- At a minimum, it should have course number and title, and name and location of the school/unit.
- It may contain a main menu with all major sections listed with hyperlinks to each section, or you may choose a hierarchical menu in which the main menu leads to sub-menus with further links. Limit the number of sub-menus to three if possible.
- Choose sequential pages in which the homepage scrolls down sequentially.
- Choose the linear selection model in which buttons are marked on a line that represents different stages or time periods along a continuum.

Air Force Disclaimer and Copyright Information: Be sure to check Air Force requirements for disclaimers on Web-sites and for copyright information.

Introduction: List on the home page any greetings, credits, date of last update and other pertinent data.

Technical Requirements and Help: Use this page to indicate minimum computer configuration and software requirements, special procedures, on-line resource links, links for downloading web browser, and how to obtain technical help.

Critical Course Data: Depending on the size and purpose of your IBI project, list these things on separate pages:

- Course overview
- Course objectives
- Class syllabus and outlines
- Course requirements and prerequisites
- Course schedule

Assignments and Tests: Be sure to include a section that lists student assignments, required readings, criteria for grading, due dates and penalties for late work. Include all information relating to tests and grading procedures. Give a sample test, and provide download capability.

Size of Text/Audio/Video/Graphic Files: Inform users of the approximate file size, and how long downloads will take.

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Development (continued)

Basic IBI Components (continued)

Time of Day/Traffic on Net: Inform users of the best time of day (least traffic) to use the Internet.

Administrative Information: List any requirements and protocols relating to how students gain access to support personnel for information related to enrollments, completion dates, disenrollments, etc. Provide links to appropriate administrative officers and to relevant institutional policies.

Procedures for Student Advising and E-mail Addresses of Instructional Personnel: Be sure to tell students how they can get advice and instructional help.

Biographical Sketches of Instructional Personnel: Include biographies of all key personnel who may be interacting with the students. Invite learners to include brief biographical sketches; provide instructions on how to do this. (Note: It is better to have learners enter their own information to protect Privacy Act information.)

Glossary of New Terminology: Define all new terms. Key words can be linked to these definitions throughout the course via hypertext.

Supplemental Resources List: List relevant resources and where to locate them.

Frequently Asked Questions (FAQ) Pages: Posting frequently asked questions and their answers will cut down on the number of spontaneous questions asked.

How to Learn and Protocols: Include an explanation on how to learn on-line and how to navigate through the course.

- Point out major differences associated with this new mode of learning.
- Clearly state the roles and responsibilities of the instructor and students.
- Clarify the rules of engagement for on-line communication.

Course Evaluation and Feedback Forms: Give students an opportunity to evaluate the course and to give feedback during the course.

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Development (continued)

Additional IBI Components

In addition to the basic IBI components, other on-line features might be incorporated into a virtual "classroom". Procedures need to be established during the development phase.

On-line Interaction: Make sure students have a way to communicate on-line. The following modes can be used:

- *One-to-one* can be used for confidential communications between individual students and the instructor or when two students need to have a private conversation.
- *One-to-many* is similar to the traditional lecture approach and works for lecture style presentation.
- *Many-to-one* is a special feature that allows students to access experts around the world in a conferencing session, or by posting their questions.
- *Many-to-many* is a discussion group forum such as bulletin boards or conferencing areas and is described below. Asynchronous conferencing can become difficult to follow if too many people are interacting.

Conferencing: Chat room, bulletin board, E-mail and several COTS products provide mechanisms to features for students to post information and to raise or respond to topic-related questions.

- Software used for this will list the date and time of each comment, the name (or cyber nickname) of the student making each comment.
- Chat room or bulletin board discussions can be threaded (i.e., tied to each other electronically so that related conversations are linked), electronically archived for analysis, and printed.
- If synchronous on-line conferencing is used, the software will indicate when a student enters the conference so all participants can see who is present in the forum.
- Limit the number of people who can participate in a synchronous conference so that the discussions do not become unruly.

On-line Library and Web Resources for Reference Materials: Include electronic or on-line access to topical areas and hyperlinks to relevant on-line resources.

Directory of Other Students: Because these methods of IBI involve student-to-student interaction, each student should know who is registered for the course and how to get in touch with other students.

Student Evaluation/Testing: Any IBI course should incorporate some form of knowledge testing. On-line testing using Web page forms to provide fill-in-the-blank, short answer, multiple-choice, and true-false questions is one possible method for evaluating students. However, security of test material and test results, and student authentication are issues that would need to be addressed if a proctor is not available to monitor the student testing.

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Development (continued)

Helpful Hints for Instructional Designers

The following helpful hints and support strategies are provided for IBI instructional designers/developers:

- Divide the learning event into smaller segments and use various types of technology to meet the different learning goals.
- Design instructional content for readability, navigability, and interaction, all of which affect learner retention.
- Use standardized templates, and keep screens simple and uncluttered.
- Use forms creatively to provide active learning and interaction (feedback, quizzes/testing, interface to databases, etc.)
- Avoid using fixed width tables.
- Use frames only if necessary since they increase complexity and apparent load time.
- Image maps provide a graphical interface for navigation/hyperlinks, but they must be used wisely since the transfer/load time is longer.
- Make documents easy to print (consider distributing lengthy documents in printed format to avoid shifting the cost and burden of printing to the user/unit).
- Check all URLs to ensure they are current and that they do not contain any objectionable material.
- TEST EVERYTHING!!!!

Use of Color

Tips for using color:

- Use color sparingly and consistently.
- Use color for contrast and to highlight specific words.
- Avoid clashing colors. Soft backgrounds with sharp contrasting text usually work best.
- Select a text color that will be legible when printed. Then test it.

Use of Text

Tips for text:

- Use no more than three different font sizes on a page.
- Flush left margins are better than centered text.
- Do not display text that disappears after a certain amount of time.
- Use lists instead of paragraphs to cut down on text.
- Avoid special effects (blinking, flashing, or moving text) unless desired for emphasis, or to gain attention.
- Use natural dialogue and a spell checker.

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Development (continued)

Use of Graphics/Images

Tips for graphics/images:

- For optimization, use the JPEG file format for high color photographs and the GIF file format for 8-bit images, if possible.
- Use thumbnail images with links to larger files, if possible.
- Use images for functional reasons such as for navigation, clarification, or identification, not to entertain the learner.
- Use smaller graphics when possible to speed up download time.

Use of Video

Some tips for producing quality video files or streaming video for the Internet are:

- Do not indiscriminately use videos produced for TV monitors. Net video reduces resolution significantly. What looks good on a TV may look bad on the net. Produce or re-edit Net videos from scratch. Test them prior to use to ensure quality.
- Make titles big. Avoid shots with small details. Type is difficult to read with low resolution and small frame sizes. Use close-ups to enhance detail in important areas.
- Avoid lengthy head shots. Lip synchronization may be a problem. Avoid tight close-ups. Text may obscure part of the image.
- Use smaller frame sizes for video to enable as fast a frame-per-second rate as possible.
- Make video sequences as short as possible.
- Open and close video sequences with high quality still frames.
- Use many illustrative cutaways. If the video slows down, the cutaways will look like still frames instead of long dissolves or wipes.
- Use fewer colors in video graphic screens and animations. For graphics, use a 16-color palette and avoid shading, transparencies, and textures.
- Use the highest quality camera available, preferably a digital video camcorder, and edit digitally (digital in, and digital out). The better the source, the better the end result.
- When creating primary .AVI or MPEG files from videotape masters, create several versions with different audio bit rates prior to recording for the Web. This will help in the selection of that format for the .AVI file that provides the best compromise between music and voice.
- Most streaming video encoders work best with uncompressed .AVI source files.

Test and retest everything – there is no substitute for quality.

Section D

IBI Implementation

Introduction

Once the IBI course is on-line and operational, it is important to ensure that the instructional system continues to receive the necessary support and maintenance. Both internal and external evaluations should be conducted regularly to ensure effective instruction and cost-efficient operations are maintained.

Implementation functions include:

- Management
- Administration
- Support
- Delivery
- Conduct of Instruction

Management Function

Management of the instructional system does not end with the implementation of the IBI course of instruction. The continued planning, organizing, coordinating, evaluating, and reporting activities are the shared responsibility of all the individuals directly involved with the IBI course. Active management of a distance learning course versus a traditional resident course is more critical because of the distributed and dynamic nature of the instruction and resources.

Administration Function

Administrative support is an essential component of a successful IBI program. This function is performed by the support staff (at both individual DL sites and at the IBI administrative center). The development of the administrative processes and procedures was accomplished during the development phase. Implementation requires the careful coordination of those processes and procedures, including:

- Student management (registration, processing, data tracking, etc.)
- Administrative records and reports
- Personnel support (personnel records, processing, etc.)
- Resource scheduling and tracking (students, equipment utilization, etc.)
- Database management.

Note: Course administration takes on new dimensions when delivering courses over the Internet. Developers are advised to contact AFDLO for guidance on establishing appropriate processes and procedures on this subject.

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Implementation (continued)

Support Function

An IBI course cannot be effectively delivered or maintained unless technical, maintenance, and training support are available. As stated in the previous section, the requirements, processes and procedures should have been developed and tested during the development phase. The support functions include:

- Maintaining facilities and equipment.
- Supplying equipment and instructional course materials.
- Providing services such as network engineering, courseware revision and maintenance, publication, etc.

Helpful Hints for Instructors

The following are helpful hints and support strategies for IBI instructors:

- Be aware that students have different learning and communication styles.
- Remember that students must take responsibility and an active role in the learning process.
- Plan to introduce the students to the IBI process. Make sure they understand how the course will be administered and what protocols will be used.
- Distribute class announcements through E-mail or post in a special area on the bulletin board.
- Use pre-class study assignments, questions, and guides to prepare students for interactive or collaborative on-line lessons. Encourage discussion and interaction.
- Put lecture notes on-line for student reference.
- Provide timely feedback via E-mail, fax, phone, etc., regarding performance on tests, assignments, and projects to help motivate the student.
- Recruit other SMEs and interesting personalities to lecture on-line or to have discussions with the students.
- Provide a range of approved universal resource locators (URLs) or hot links for supplemental reading and research.
- Prepare case studies and make separate pages for each. Divide students into groups and have them discuss in a conference and publish on-line reports.
- Use a traditional case study with open-ended questions built into the body. Students would answer the questions by filling in blanks in scrolling text files. Both the questions and the answers would appear within the case file.
- Set up a student group to serve the function of the “student lounge”. On-line students can interact without the instructor looking in.
- Encourage brainstorming in a small-group setting by opening up a separate conference area and invite students to come up with solutions to particular problems or to generate ideas and proposals.

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Implementation (continued)

Helpful Hints for Instructors (continued)

- For on-line collaboration among members of a large group, it is important to focus the group (and keep them focused) on a particular problem or set of issues.
- To compensate for the lack of cues that indicate feelings and emotions, adopt a set of symbols to convey emotions.
- Humanize the process. Make sure students have access to a real live human tutor. Personally, welcome each student to the on-line class.
- Assign specific research tasks to students either individually or in groups. Students can present reports online or publish their reports on their own web pages.
- Establish electronic and telephone office hours as required to assist students.

Delivery Function

Instructors. The effectiveness and success of a distance learning program are dependent primarily upon the instructors who manage and deliver the instruction. The instructors must adapt to a learner-centered instructional environment and change from their traditional role as a teacher to become more of a facilitator, guide, consultant, resource provider, and learning team member. Therefore, instructors must be able to:

- Understand the needs of the remotely located students.
- Be sensitive to the different learning styles and adapt the instruction.
- Effectively function as a facilitator and content provider.
- Understand the delivery technology and effectively use the equipment.
- Be prepared to spend more time on learner support that one would for a traditional course; responding to learners' e-mails, participating in chat rooms, and providing individualized guidance can consume a great deal of time.

Delivery System. Operating and maintaining the instructional delivery system is another key function. The most critical component is the computer network system, which is the primary instructional link or bridge to the student.

The student (and instructor) must be proficient with the computer equipment, and have reliable network access and connections. If required, computer training must be provided to minimize the occurrence of "operator errors".

Note: Technological advances now permit access to the Internet by means of television which is PC independent. As technology evolves, the impact of interface and capacity issues will decrease.

Section E

IBI Evaluation

Introduction

Evaluation is the last phase in the ISD process. As with other instructional technologies, the evaluation process for IBI consists of a formative, summative, and operational evaluation (refer to Chapter 2). This section addresses the special considerations for conducting IBI evaluations.

Formative Evaluation

The formative evaluation begins in the analysis phase and continues through the development phase of the ISD process. Because IBI learners are usually remote from any direct support structure, formative evaluation of the course takes on absolutely critical importance.

The rule is: test and retest.
And then test again.

Summative Evaluation

The primary purpose of the summative evaluation is to determine whether the IBI course achieves the established objectives. In the case of IBI, this assessment also includes an evaluation of the effectiveness of the delivery system and support processes.

It must be noted that IBI courses present unique challenges for those preparing a summative evaluation program. A limited access site should be established so that impartial representatives of the learner population can access the course and perform the required activities. Structured feed back forms can be developed to help the sample learners focus and comment on specific aspects of the course. The feedback received from the sample learners is used to identify problems and take corrective actions prior to implementation of the course.

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Evaluation (continued)

Operational Evaluation

Operational evaluation is an ongoing process that accomplished after the formative and summative evaluations. This evaluation is based on internal and external feedback data such as:

- Instructor/facilitator comments (internal)
- Student critiques (internal)
- Results of embedded data collection systems (metrics to assess reliability of hardware/software, and to collect data such as student connect time, time spent in course-established chat rooms, etc.)
- Test results (internal)
- Inspection and evaluation reports (external)

Results of such assessments are considered during course update cycles.

Areas of Evaluation

Design the evaluations to get both positive and negative feedback. Some general areas to consider in evaluating the delivery of the IBI course are:

- Course content - organization, relevancy, clarity, quality, currency, etc.
- Course materials - adequacy, availability, effectiveness, currency, etc.
- Instructional methods/media - effectiveness, interaction quantity/quality, etc.
- Instructional equipment - availability, reliability, ease of use, etc.
- Internet/Intranet network - access, speed, reliability, etc.
- Instructor support - necessity, availability, effectiveness, etc.
- Technical support - access, availability, timeliness, effectiveness, etc.
- Administrative support - usefulness, adequacy, availability, etc.

Evaluation Strategies

Various collection strategies can be employed to gather IBI evaluation data:

- Written questionnaires/critiques/tests that can be mailed or faxed.
- Electronic questionnaires/critiques/tests that can be accomplished on-line.
- E-mail/bulletin board correspondence.
- Audio conferences.
- Telephone interviews.